

Chapter 6 review

filled in

Practice Distance and Midpoint Formula

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$mid.pt = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

Find the midpoint of the line segment with the given endpoints.

1) (1, 3), (3, 1)

$$mid pt = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{1+3}{2}, \frac{3+1}{2} \right)$$

$$= \left(\frac{4}{2}, \frac{4}{2} \right)$$

$$= (2, 2)$$

2) (4, -5), (-6, 3)

$$mid pt = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left(\frac{4-6}{2}, \frac{-5+3}{2} \right)$$

$$= \left(-\frac{2}{2}, -\frac{2}{2} \right)$$

$$= (-1, -1)$$

Find the other endpoint of the line segment with the given endpoint and midpoint.

3) Endpoint: (-10, 10), midpoint: (-4, -4)

$$mid pt = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$(-4, -4) = \left(\frac{-10 + x}{2}, \frac{10 + y}{2} \right)$$

$$-4 = \frac{-10 + x}{2} \quad -4 = \frac{10 + y}{2}$$

$$-8 = -10 + x \quad -8 = 10 + y$$

$$2 = x \quad -18 = y$$

$$(2, -18)$$

4) Endpoint: (-7, 6), midpoint: (10, 7)

$$mid pt = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$(10, 7) = \left(\frac{-7 + x}{2}, \frac{6 + y}{2} \right)$$

$$10 = \frac{-7 + x}{2} \quad 7 = \frac{6 + y}{2}$$

$$20 = -7 + x \quad 14 = 6 + y$$

$$27 = x \quad 8 = y$$

$$(27, 8)$$

Find the distance between each pair of points.

5) (-7, 0), (-2, 0)

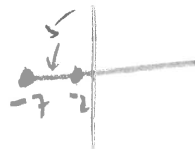
$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(-7 - (-2))^2 + (0 - 0)^2}$$

$$= \sqrt{(-5)^2}$$

$$= \sqrt{25}$$

$$= 5$$



6) (8, 1), (6, 5)

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

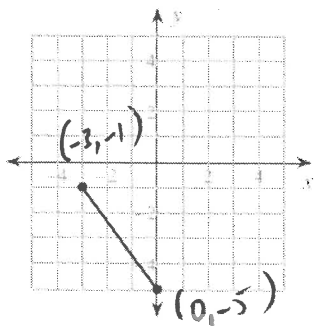
$$= \sqrt{(8 - 6)^2 + (1 - 5)^2}$$

$$= \sqrt{2^2 + (-4)^2}$$

$$= \sqrt{4 + 16}$$

$$= \sqrt{20} = 2\sqrt{5}$$

7)



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(-3 - 0)^2 + (1 - (-5))^2}$$

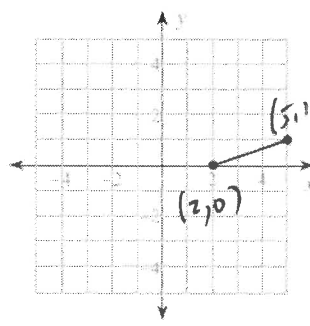
$$= \sqrt{(-3)^2 + 6^2}$$

$$= \sqrt{9 + 36}$$

$$= \sqrt{45}$$

$$= 3\sqrt{5}$$

8)



$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$= \sqrt{(2 - 5)^2 + (0 - 1)^2}$$

$$= \sqrt{(-3)^2 + (-1)^2}$$

$$= \sqrt{9 + 1}$$

$$= \sqrt{10}$$

1) (2, 2)

5) 5

2) (-1, -1)

6) $2\sqrt{5}$

3) (2, -18)

7) 5

4) (27, 8)

8) $\sqrt{10}$

10. - CHAPTER 6 REVIEW NAME: _____ EX: 6.1

This review package can be completed as we work through the chapter or at the latest the night before the review class for the chapter test. Use it as an on-going review or as a study booklet right before the test. The answers will be posted during the review class before the chapter test.

- a) Explain what the slope, m , means in words.

$$m = \frac{?}{?}$$



$$m =$$

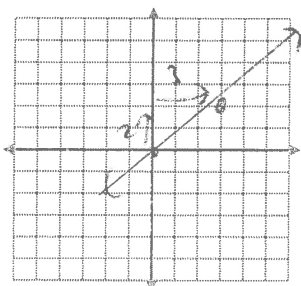
$$\frac{\text{difference in } y}{\text{difference in } x} = \frac{\text{rise}}{\text{run}}$$

- b) All horizontal lines have slopes equal to 0

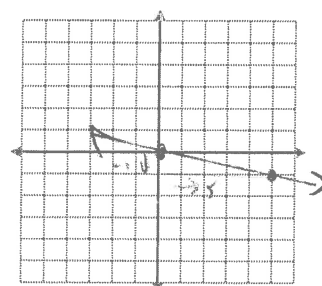
- c) All vertical lines have slopes that are undefined

Draw a line segment with slope equal to

a) $\frac{2}{3}$



b) $-\frac{1}{5}$

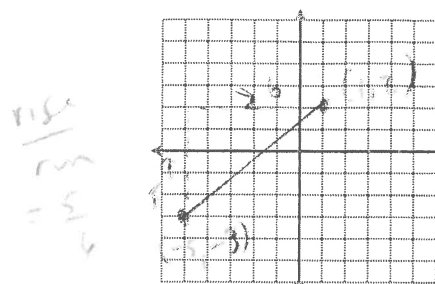


- a) Use the slope formula to calculate the slope of the line that passes through $(-5, -3)$ and $(1, 2)$.

$$\begin{aligned} m &= \frac{y_2 - y_1}{x_2 - x_1} \\ &= \frac{-3 - 2}{-5 - 1} \\ &= \frac{-5}{-6} \\ &= \frac{5}{6} \end{aligned}$$

leave as simplified fraction

- b) Plot the points and draw a line segment to connect them. Verify your answer in a) by indicating the rise and the run on your graph.



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Line AB passes through $A(-1, 3)$ and $B(9, -5)$. Line PQ passes through $P(-2, -1)$ and $Q(3, -5)$. Are these two lines parallel, perpendicular or neither? Explain your answer.

$$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{3 - (-5)}{-1 - 9}$$

$$= \frac{8}{-10} = -\frac{4}{5}$$

$$m_{PQ} = \frac{-1 - (-5)}{-2 - 3}$$

$$= \frac{4}{-5}$$

$$= -\frac{4}{5}$$

$m_1 = m_2$
 \therefore parallel

Determine the slope of a line that is perpendicular to the line through $C(0, -3)$ and $D(-1, 4)$.

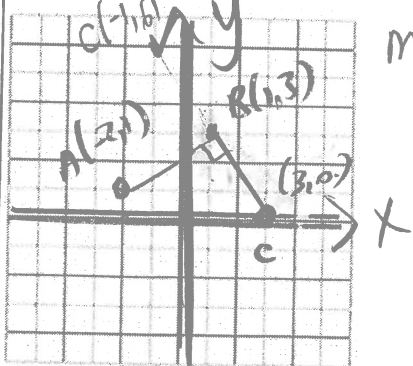
$$m_{CD} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-3 - 4}{0 - (-1)}$$

$$= \frac{-7}{1} = -7$$

A line \perp to CD
 would have slope $\frac{1}{7}$
 (negative reciprocal)

The coordinates of the segment \overline{AB} are $A(-2, 1)$ and $B(1, 3)$. Determine a possible coordinate for C so that $\overline{AB} \perp \overline{BC}$. (\overline{AB} is perpendicular to \overline{BC}). Explain your work.



$$m_{AB} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{3 - 1}{1 - (-2)}$$

$$= \frac{2}{3}$$

$$\therefore m_{BC} = -\frac{3}{2}$$

Use $\frac{\text{rise}}{\text{run}}$
 to count
 from
 $B(1, 3)$
 down 3
 over 2 (to right)
 C is $(3, 0)$

(could also be up 3
 left 2)
 $C(-1, 6)$

10. - CHAPTER 6 REVIEW

NAME: _____

EX: 6.4

This review package can be completed as we work through the chapter or at the latest the night before the review class for the chapter test. Use it as an on-going review or as a study booklet right before the test. The answers will be posted during the review class before the chapter test.

$$y = mx + b$$

For each slope-intercept form of an equation, identify the slope and the y-intercept.

a) $y = \frac{1}{2}x + 5$

slope: _____

y-intercept: _____

b) $y = 3 - x$

slope: _____

y-intercept: _____

c) $y = 7$

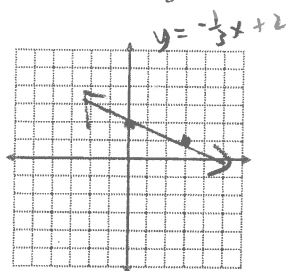
slope: _____

y-intercept: _____

Graph each line given the information below.

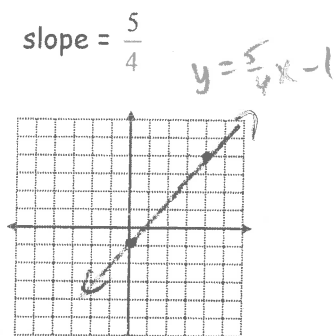
a) y-intercept = 2

slope = $-\frac{1}{3}$

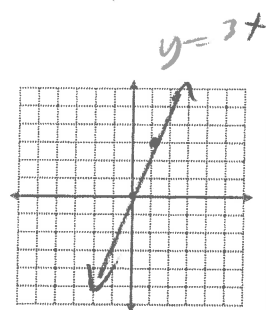


b) passes through (0, -1)

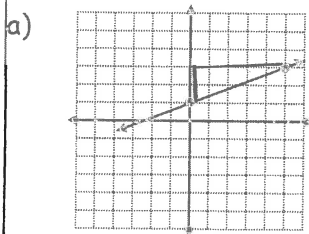
slope = $\frac{5}{4}$



c) $y = 3x + 0$



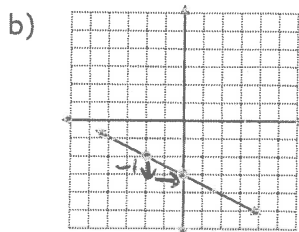
Write an equation to describe each of the following lines.



Equation:

$$y = \frac{2}{5}x + 1$$

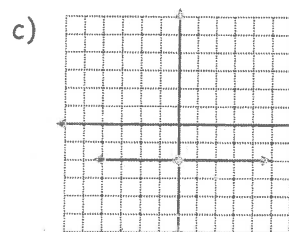
$b = 1$
 $m = \frac{2}{5}$



Equation:

$$y = -\frac{1}{2}x - 3$$

$b = -3$
 $m = -\frac{1}{2}$



Equation:

$$y = 2$$

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$$y - y_1 = m(x - x_1)$$

Given the slope-point form of equations of lines, identify a point the line passes through and the slope of the line.

a) $y - 3 = \frac{1}{4}(x + 1)$

point: $(-1, 3)$

slope: $\frac{1}{4}$

b) $y + 2 = -\frac{1}{3}(x - 2)$

point: $(2, -2)$

slope: $-\frac{1}{3}$

c) $y + 4 = (x + 6)$

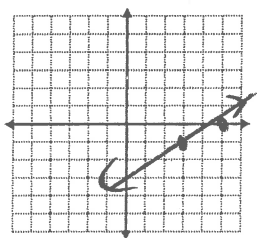
point: $(-6, -4)$

slope: 1

Graph each line given the information below.

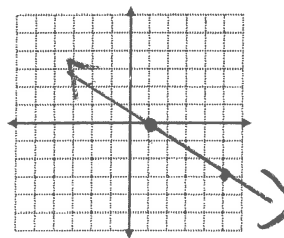
a) passes through $(3, -1)$

slope = $\frac{1}{2}$



b) x-intercept = 1

slope = $-\frac{3}{4}$



Write an equation for the line in slope-point form given the following information.

a) passes through $(-3, 5)$

slope = -4

$$y - 5 = -4(x + 3)$$

b) passes through $(-1, 2)$ and

$(5, -1)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{2 + 1}{-1 - 5}$$

$$= \frac{3}{-6}$$

$$= -\frac{1}{2}$$

$$y - 2 = -\frac{1}{2}(x + 1)$$

$$\text{or } y + 1 = -\frac{1}{2}(x - 5)$$

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$$Ax + By + C = 0$$

Write each equation in general form.

a) slope-intercept form

$$y = -\frac{3}{2}x + 5$$

$$2y = -3x + 10$$

$$3x + 2y - 10 = 0$$

b) slope-point form

$$y + 2 = \frac{4}{5}(x - 1)$$

$$5y + 10 = 4(x - 1)$$

$$5y + 10 = 4x - 4$$

$$4x - 5y - 14 = 0$$

Determine the x-intercept and the y-intercept for each of the following lines.

a) $2x - 3y + 12 = 0$

x-intercept: $\frac{-b}{a}$

$$y = 0 \quad 2x - 3(0) + 12 = 0 \quad 2x = -12$$

y-intercept: $\frac{c}{b}$

$$x = 0 \quad 2(0) - 3y + 12 = 0$$

$$-3y = -12 \quad y = 4$$

b) $4x + 2y - 1 = 0$

x-intercept: $\frac{1}{4}$

$$4x + 2(0) - 1 = 0 \Rightarrow 4x = 1 \rightarrow x = \frac{1}{4}$$

y-intercept: $-\frac{c}{a}$

$$4(0) + 2y - 1 = 0$$

$$2y = 1 \quad y = \frac{1}{2}$$

Write each equation in slope-intercept form. $y = mx + b$

a) $2x - 3y + 18 = 0$

$$3y = 2x + 18$$

$$y = \frac{2}{3}x + 6$$

b) $x + 3y - 12 = 0$

$$3y = -x + 12$$

$$y = -\frac{1}{3}x + 4$$

c) $5x - y + 11 = 0$

$$y = 5x + 11$$